trotec®
laser. marking cutting engraving

setting new standards

SpeedMark Tutorial 1

Quick-Start-Guide SpeedMarker Series

SpeedMark Tutorial 1 for SpeedMarker Series | V001_SM-Tutorial (08/2015)
ENGLISH

SpeedMark

Content

1 Objectives of this tutorial 3
2 Turning on the SpeedMarker laser 4
3 Focus the laser 6
3.1 Focus Finder 6
3.2 Software controlled Z-axis 7
3.3 Axis control command 7
3.4 Measuring the distance 8
4 Adding text 9
5 Filling text with a hatching pattern 11
6 Choosing marking parameters 12
7 Position the job 13
8 Start marking 14

1 Objectives of this tutorial

This document will show how to do the first steps with a SpeedMarker laser system.

- Power up the laser
- Focus the laser
- Insert text in SpeedMark software and use hatching routines
- Setting of laser parameters
- Marking of texts

Requires:

- SpeedMarker
- F160 lens
- SpeedMark Software
- Flat piece of anodized aluminum

Figure 1: SpeedMarker series

2 Turning on the SpeedMarker laser

1) Turn on the computer

2) Turn on the laser rack with main switch as shown in the picture below

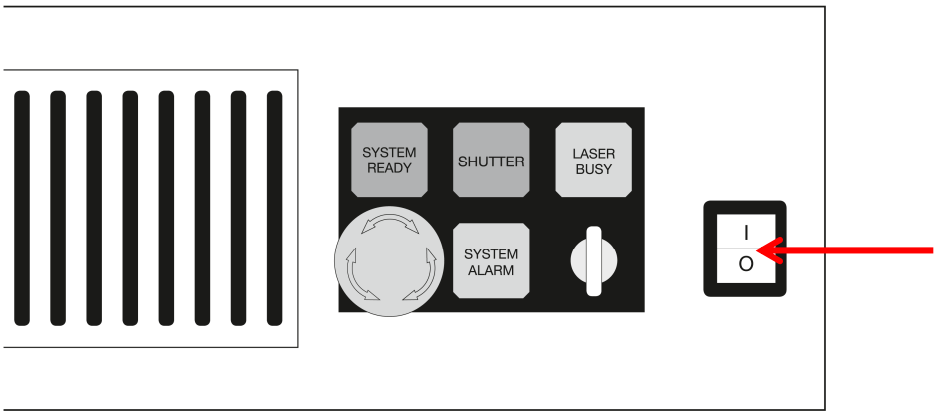

Figure 2: laser rack SpeedMarker

2)a) In the case you are using a SpeedMarker 700 or SpeedMarker 1300, turn on the main power supply. Check that both, computer and laser rack is switched on.

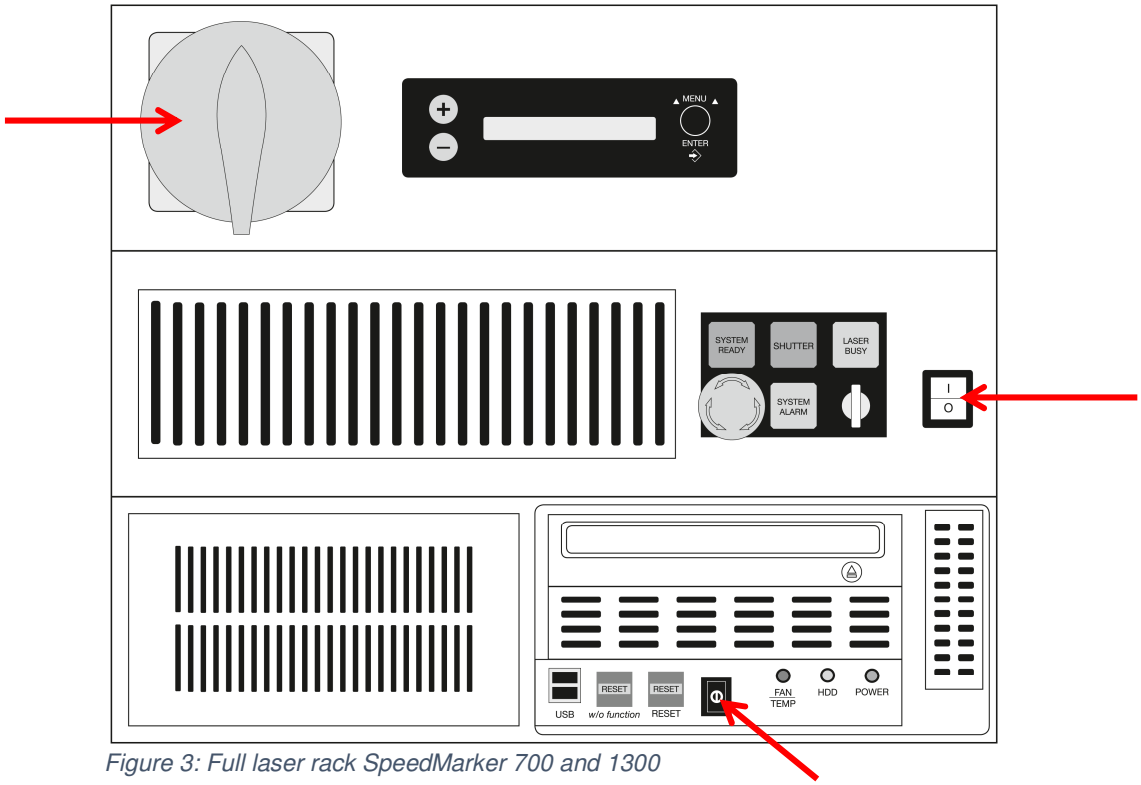

Figure 3: Full laser rack SpeedMarker 700 and 1300

© Trotec Laser GmbHSpeedMark Tutorial 1 for SpeedMarker Series | V001_SM-Tutorial (08/2015)

3) Reset System Alarm

When the laser is turned on the “System Alarm” needs to be reset as shown in the picture below. If the alarm cannot be reset, check the E-stop switch at the front of the rack and ensure that no external E-stops circuits are open (X31 and X11).

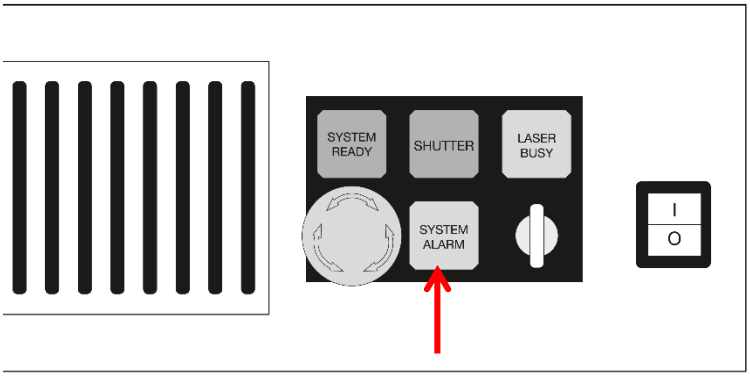

Figure 4: Reset system alarm at laser rack

3)a) In the case you are using a SpeedMarker 700 or 1300, wait until the green **Power LED** is on and the red **Error LED** on the laser workstation front panel is blinking. Then press the ON button twice to reset the workstation and the laser.

Figure 5: Laser workstation front panel of SpeedMarker 700 and 1300

Check that the green **On LED** on the front panel is on and both the red **Error LED** as well as the red light on the laser rack are both off. (The laser rack can be reset separately by pressing the red "**System Alarm**" button on the rack itself, see figure 4)

4) Check control lights
Check that the green "System Ready" and "Shutter" lights are both on. If they are not lit, first check that the key switch is in the horizontal position as shown above. When the SpeedMarker laser is built with an enclosure (laser workstation: SpeedMarker 300, 700 or 1300), the green lights will only come on once the cover is closed. If the lights remain off, check that the interlock circuits are closed (connector X11 on rear of rack).

5) Start SpeedMark software
Double click the SpeedMark icon on the desktop or start SpeedMark from the Start menu (Start – All Programs – trotec).

Figure 6: SpeedMark icon on the desktop

Your SpeedMarker laser system is now ready for marking.

3 Focus the laser

Besides picking correct marking parameters, finding the correct focus distance is the most important step for a good mark. Depending on the setup, the focus can be adjusted by either moving the marking head up or down relative to the fixed object or by adjusting the height of the work piece relative the marking head. There are several ways to find the correct focus distance depending on your product and your individual configuration.

There are 4 Options of finding the correct focus distance.

3.1 Focus Finder

The Focus Finder is a useful option to quickly and without additional tools find the correct focus distance. It uses a second pilot laser pointed under a defined angle that will exactly overlap with the moving pilot laser dot when in the focal plane. Especially when no software controlled z-axis is available (input of component height in the software), this is a very user friendly possibility:

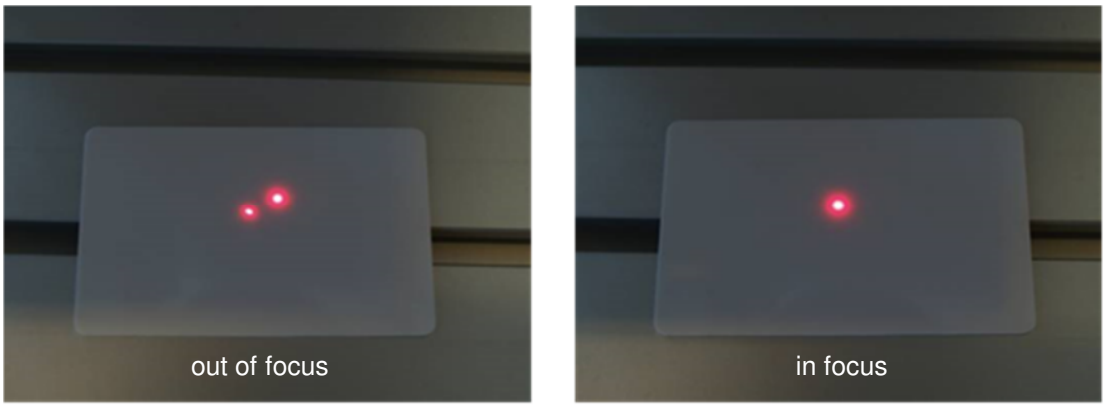

Figure 7: Focus finder

3.2 Software controlled Z-axis

If the SpeedMarker (300, 700 and 1300) is equipped with a software controlled Z-axis, by default the zero position is set so that the focus corresponds to the top of the table. By opening the axis control window (View – Z-axis) and moving the axis to the height of the work piece the laser will be in focus.

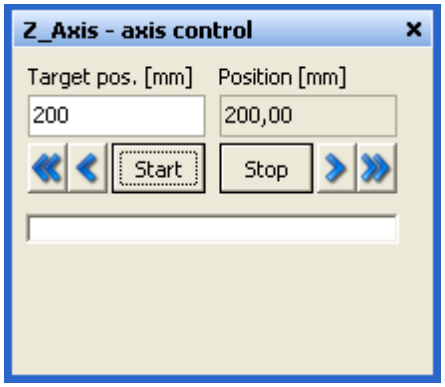

Figure 8: software controlled Z-axis

3.3 Axis control command

In the case, you are using a SpeedMarker 300, 700 and 1300 with a software controlled z-axis, it is also possible to use the axis control command of SpeedMark software that allows to control the z axis directly within the SpeedMark program. With this function it is easily possible to have several z positions during one program flow. This is necessary for complex objects with different surface heights or if you want to combine different marking processes within one program.

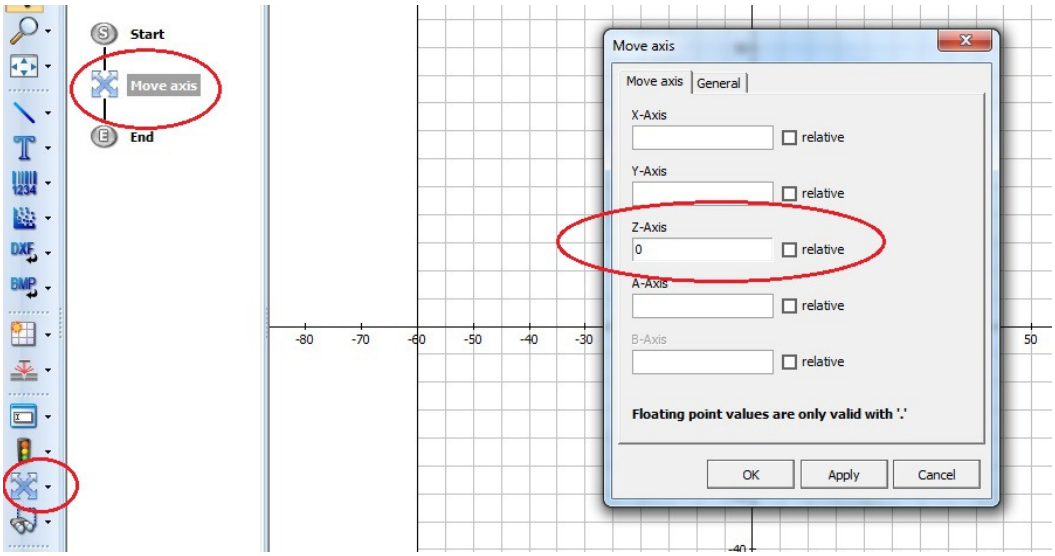

Figure 9: Axis control command within SpeedMark software

3.4 Measuring the distance

Measuring the distance between the galvanometer scan head and the work piece is a second way of focusing if the Focus Finder is not installed. Using a ruler or tape measure adjust the distance between the bottom side of the galvanometer scanner and the work piece to be the required distance:

Lens	Working distance D (+/- 0,2 mm)	Marking field
F-100	134,6 mm	70 x 70 mm²
F-160	211,6 mm	120 x 120 mm²
F-254	361,6 mm	190 x 190 mm²
F-330	456,6 mm	240 x 240 mm²
F-420	562,6 mm	310 x 310 mm²

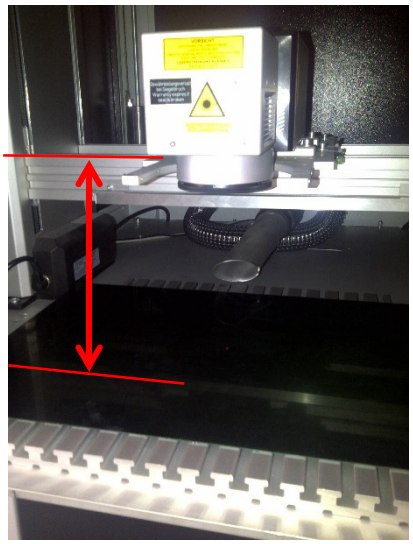

Figure 10: Measuring the distance

4 Adding text

1. Click the “Text” element in the graphic tool box.

2. There are two methods of adding elements:
   a. Place the cursor in the flow chart and add the element in a user defined position in the flow chart. This will automatically place the element in the middle of the marking area.
   b. Place the cursor in the marking area; this will add the element in the exact location of the cursor and as the last element in the flow chart.

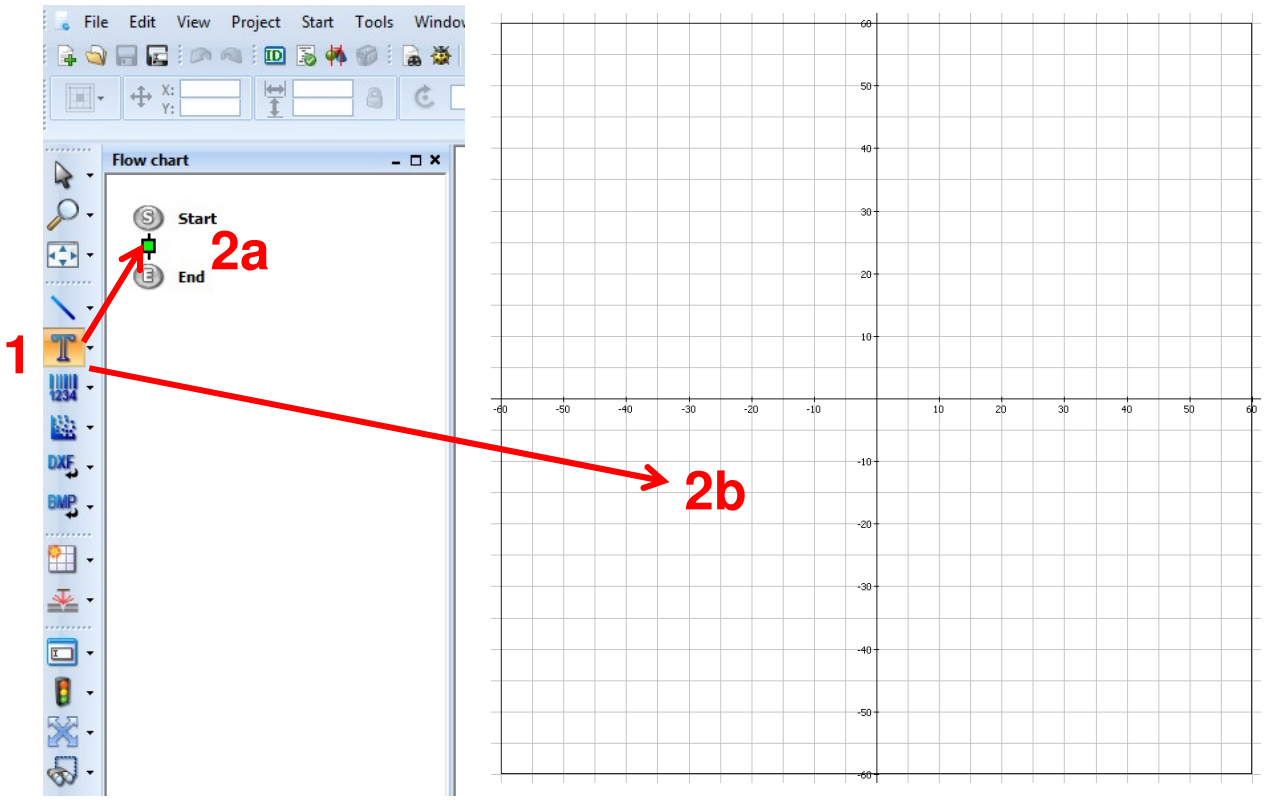

Figure 11: SpeedMark user surface: adding text

3. Adding the text (left mouse click) opens a window that lets you enter text and define text properties (All Properties can be changed after the text is added).
   For this tutorial enter your name in the text window as shown below.

4. Press the **Add** button to insert the text. The text should now appear in the marking area.

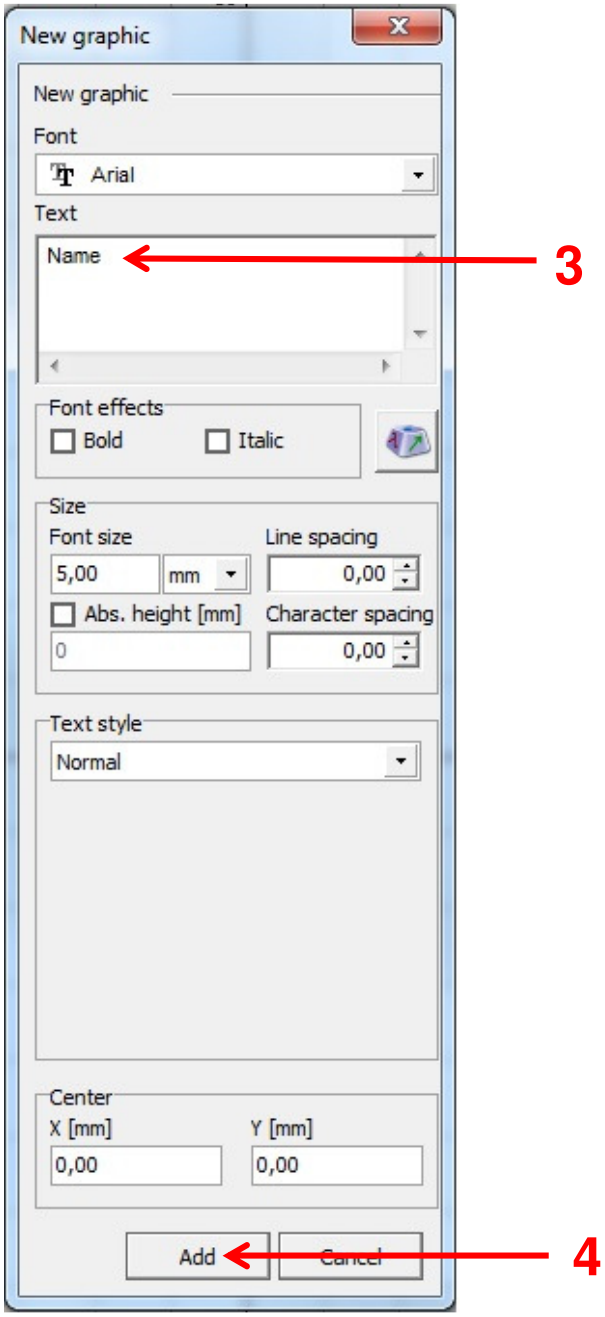

Figure 13: Text window

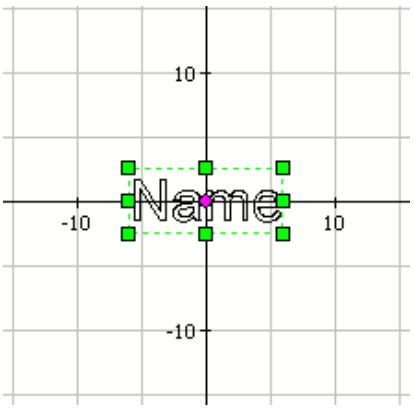

Figure 12: Marking area

Tip:
Pressing the text icon in the tool bar *twice* will cause the cursor to remain in the text mode, so every new click will add a new text element.

To learn more about the different text functions, refer to page 40 ff. of the SpeedMark user manual.

5 Filling text with a hatching pattern

The text should now appear as outlined letter as shown above (If the text appears as single line letters, go back to the toolbar and make sure that you have selected outline text).
As a next step the outline text needs to be filled with a hatching pattern to give a better contrast.

1. Ensure that the text element is highlighted. In the flow chart it should appear with a blue box and in the marking are the text should show a bounding box.
   Go to tap called Filling in the Graphic properties window on the right of the screen.

2. From the drop down menu choose Parallel lines

3. If necessary adjust the distance between the lines. For this example of marking anodized aluminium a hatch spacing of 0,03mm (0.01") should give good results.

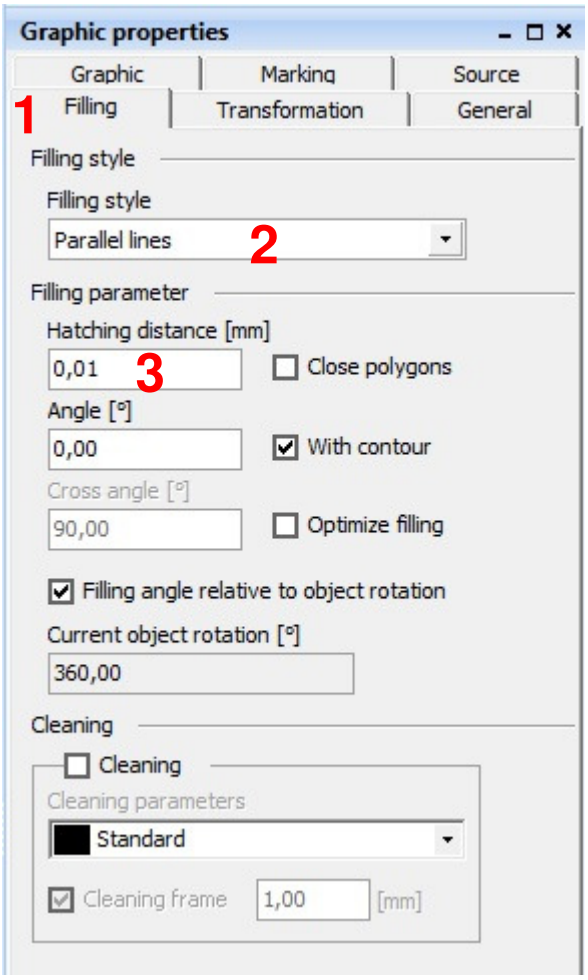

Abbildung 1: Filling witch hatching pattern

Tip:
The hatch spacing has a significant impact on the marking time. So optimizing the hatch spacing should be a first step when the marking time needs to be reduced.

6 Choosing marking parameters

The SpeedMark installation comes complete with a first set of laser parameters for different materials. So for marking the text you only need to select the correct material from the list as follows:

1. Ensure that the text element is highlighted. In the flow chart t should appear with a blue box and in the marking are the text should show a bounding box.
   Go to tap called **Marking** in the **Graphic properties** window on the right of the screen.

2. In the first drop-down list, select the material Anodized Aluminium from the list of available materials

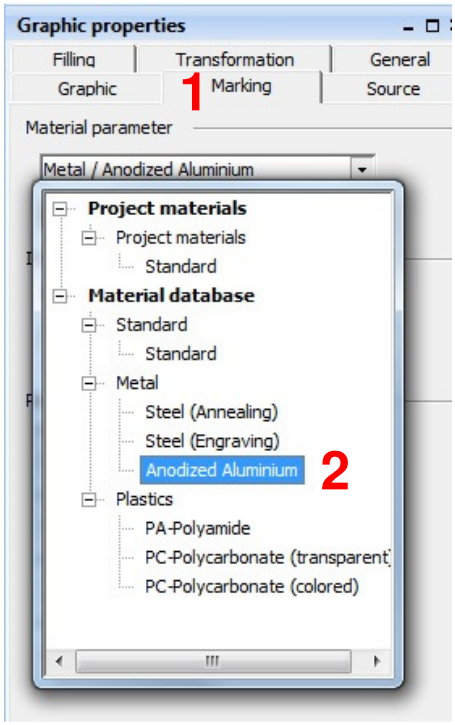

Figure 14: Material database

3. In the second drop-down list, ensure that the first, black parameter set is activated.

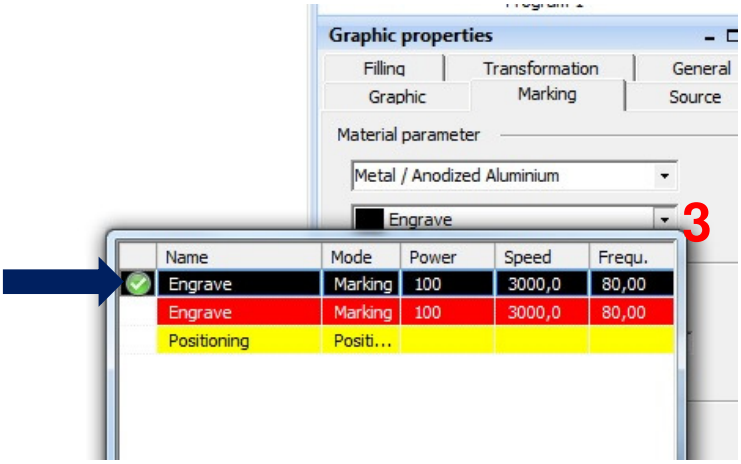

Figure 15: Material parameters

© Trotec Laser GmbHSpeedMark Tutorial 1 for SpeedMarker Series | V001_SM-Tutorial (08/2015)

7 Position the job

Before starting the marking process the pilot laser can be used to outline the position of the mark on the work piece. To start border marking press **F9** or use the icon in the menu bar.

Figure 16: icon for border marking

While the pilot laser outlines the graphic, the *Border marking* window will appear. The arrow keys can be used to reposition the graphic in the marking area. Any changes will affect the entire graphic in the marking area.

The *Stop* button (**A**) will accept the position changes and stop the pilot laser. The red X (**B**) will also stop the pilot laser but discards any changes made to the position of the graphics.

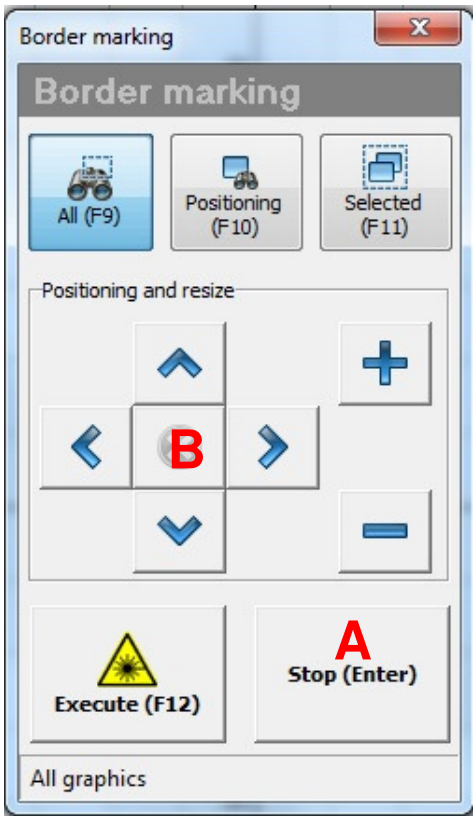

Figure 17: Border marking

8 Start marking

The marking process is started by pressing the F12 key or the *Execute* button (**A**) in the menu bar. (Or directly in the border marking window, see chapter before)

Figure 18: icon for marking

Alternatively the F8 key or the pilot laser icon (**B**) may be used to open the quick mark window as shown below.

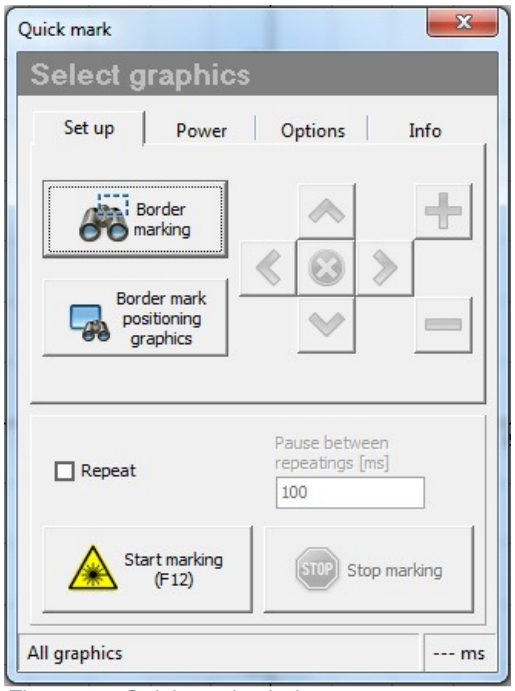

Figure 19: Quick mark window

The quick mark is intended for testing the marking settings. It will offer additional options (endless repeat, marking only selected elements etc.) over the F12 Execute option but ignore any scripting.
To start marking, press the **Start marking** button with the laser warning symbol.

Tip:
To see the marking time,

- **a)** either use the F8 key to open the quick mark menu. The elapsed marking time will be displayed in the lower right corner of the window.
- **b)** or open the **Internal runscreen** window found under *View -- Operator windows* before starting the job.

Trotec Laser GmbH
Linzer Straße 156
A – 4600 Wels
AUSTRIA

Trotec Laser GmbH
Freilingerstraße 99
A – 4614 Marchtrenk
AUSTRIA

www.trotec-marking.com

Subject to technical changes.